Promoting Sustainable Production Agriculture in Oneida County through the Implementation and Evaluation of Tactical Agriculture Teams (TAg)

Project Leader: Jeffrey J. Miller**,** Extension Educator, and CCE of Oneida County.

Cooperators: Kenneth L. Wise**,** IPM Field Crops & Livestock Specialist, Eastern N.Y., Bill Parkin**,** Summer Program Assistant, CCE of Oneida County, Mike Dennis**,** Extension Educator, CCE of Oneida County, Keith Waldron, IPM Coordinator, Livestock/ Field Crops.

Participants: (Farm Operators): Paul, Steve and Joe van Lieshout, Brabant farm; Allen and Rob Collins, Collins Knoll farm; Glen Taylor, Taylwind Farm; Jeff Vaill, Vaill Farm; Troy and Travis Finn, FinnDale Farm; Joe and Tony DiNitto, DiNitto Farm.

Participants: (Agribusinesses): Louis Gale and Sons (feed, fertilizer, seed sales), Agway Sangerfield Crop Center, Agway Pohls Feedway, Richer Feeds, Tom Brouillette (seed sales), Rob Williams (seed sales), CCE of Madison County, Brown's Feed, CCE Leatherstocking Team, CCE of Lewis County, Clinton Tractor, Cazenovia Farm Equipment, J.C. Lucas and Sons (farm equipment), White's Farm Supply (farm equipment), Jaquay Feed Company, Kuhn Farm Machinery, Madison County SWCD, Oneida County SWCD, Bob Dewaine (seed sales), Ag Radio Network, Nick Chuff (veterinarian), 6 participating farmers, Ken Wise, IPM specialist.

Abstract: An IPM TAg Team program was conducted in Oneida County during the 2000 growing season with 6 participating farms located across the county. A scout visited 2 fields (alfalfa, corn) each week, providing the scouting results directly to the participants. Participants gathered weather information, which was collected on a weekly basis by the scout. The scout summarized the information each week and faxed the information to 36 local agribusinesses and area CCE and SWCD offices for them to pass on to their clients. The same information was posted on the CCE of Oneida County website and summarized into a phone message that could be accessed by anyone in the community 24 hours/day, any day of the week. One objective of the program was to amass valuable information about pest infestations, crop development, nutrient deficiencies and local weather conditions collected on area farms and make that valuable local information available and accessible to area field crop producers and agribusinesses. A second objective was to provide "hands-on" learning opportunities of field crop management and IPM principles for the participants to help them to optimize farm profitability while minimizing environmental risk. This was accomplished through biweekly meetings in farm fields of the participants through focused discussion of timely topics of field crop management issues.

Introduction: Insects, weeds and diseases continue to reduce potential yield and quality of crops harvested by area field crop producers. Timeliness of field activities, plant populations, nutrient management, crop development, evaluation of crop condition

and other management issues continue to be paramount in profitable field crop production. Area producers have varying levels of knowledge related to these issues.

The weekly scouting of fields provided participants a greater awareness of the pest problems on their farms. Biweekly meetings held in their fields provided in depth instruction on pest identification and life cycles, economics of pest damage, scouting methods and potential alternatives for their control. Other crop-related topics like the use of PEAQ and scissor-cut methods to identify hay quality for improved timing of harvest, the use of PSNT to measure soil nitrate levels and determine the need for side dress N applications, calibration of equipment to improve the accuracy of application of inputs were discussed at appropriate times during the growing season.

This IPM TAg Team approach has been utilized in our county for over 6 years and has benefited a number of area producers. The objective of this project was to continue to use the original TAg model, which greatly benefits participating farmers while expanding the audience reached through the use of communication technologies (fax, phone messaging and web pages). A summer assistant was hired to scout two fields on each participating farm each week for a fifteen-week period during the growing season to provide current information on crop condition and pest infestation. That information was combined with weather information recorded by participants, summarized and made available to area field crop producers through the use of communication technologies.

Materials and Methods: An organizational meeting was held on April 17 to explain the IPM TAg program and solicit participants for the program. Six area farmers elected to participate during the 2000-growing season. The participants' farms were in locations spread across the County.

A summer assistant was hired (.5 FTE for 15 weeks from mid-May to the end of August) to scout participant fields and summarize scouting results for dissemination to a larger audience.

The summer assistant assembled 6 weather stations consisting of a treated 8'x2"x4" painted white, max-min thermometer and rain gauge and sited one on each participating farm. A record sheet was dropped off and participants were provided training on how to collect the maximum and minimum temperatures, reset the thermometer, read the rain gauge and record the information. The summer assistant picked up this information each week and left a new record sheet for the participant.

The summer assistant was trained in the identification of common pests of alfalfa and corn, and scouting procedures for each of the pests. He was taught how to take soil samples for PSNTs, alfalfa sampling for quality analysis, and two techniques for staging of alfalfa: Ficks' MSC and the PEAQ method. The local agent and IPM Field Crop specialist provided the training for the summer assistant. The summer assistant visited the two selected fields on each participant's farm each week. A scouting report was left at a designated location on each farm by the summer assistant after completion of each weekly scouting survey.

The summer assistant summarized the information the following day. The summarized information including pest infestation, crop condition and weather information (GDD's and rainfall) was recorded in a phone message that anyone could receive by calling our office (Appendix D). The same information was faxed to a list of 36 agribusinesses including area SWCD and CCE offices and the IPM specialist. Then the information was developed into a web page and published to the Web (Appendix C).

Biweekly meetings were held in participants' fields during the growing season from May 11, 2000 to September 6, 2000. At each of these meetings participants received hands-on training in pest identification, scouting and sampling procedures for common pests and discussed economic thresholds and alternative methods of control. The following is a list of educational topics covered during the 2000 growing season:

*Corn planter, grain drill, manure spreader and sprayer calibration,
*Corn population counts and population goals to optimize crop yield,
*Starter fertilization for cornfields,
*Pre-side-dress-nitrate test (PSNT) sampling procedure and interpretation of results to determine the need to apply side dress-N. The program assistant obtained a soil sample from each participant cornfield for the PSNT. (Appendix A)
*The identification, life cycle, scouting procedure, economic threshold and alternatives for control of common corn pests including:

- *Seed corn maggot,
- *Wireworm**,**
- *Cutworms,
- *Stem borers,
- *Slugs,
- *European corn borer**,**
- *Armyworm
- *Corn rootworm.

*We identified weeds found in the cornfields in which we met. We talked about the need to scout for weed escapes for secondary control measures and the need to survey weeds in the fall to plan weed control programs for the following season.
*At the end of the season we examined ear development and talked about milk line denting and glazing of kernels in relation to harvest and storage. A 1/1000acre area was harvested in each cornfield for yield and dry matter determination in September.
*We illustrated how to do stand crown counts and stem counts in alfalfa and their relationship to the management of hay fields.
*We showed participants how to stage their alfalfa using the Fick MSC and PEAQ methods. The program assistant obtained samples from 1 alfalfa field on each participant's farm on the 17th, 19th, 26th and 31st of May for quality analysis (Appendix B). This scissor cut program was provided to help the participants and area producers determine the best timing for the first harvest of their alfalfa.
* We also showed producers how to identify Alfalfa weevil (AW) and Potato Leafhopper (PLH) and discussed their life cycle, showed participants the scouting procedure for both, and discussed economic thresholds and alternative methods of control.

Results/ Discussion:

One way to measure the impact of an education program is to measure change in participant knowledge over the course of the program. A pre and post-test was completed by each of the participants. Participants increased their understanding of pests and IPM principles by 15 % as a result of participation in the program (Figure 1).

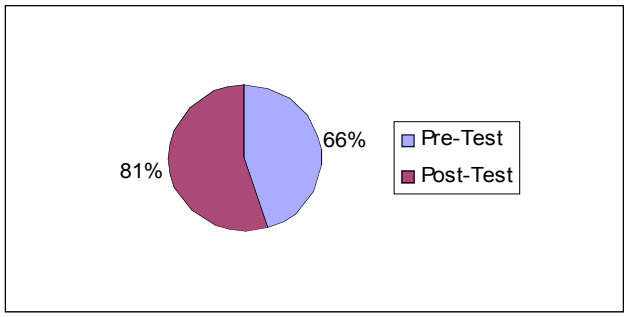

Figure 1: Graph depicts the % correct in a pre and post-test on IPM principles and practices

The scouting program helped reinforce TAg meetings. Crop and pest management data was collected on a weekly basis for the purpose of educating farmers. The data was shared with the farmers at each meeting. After discussing the management issues, farmers sampled fields for that problem to reinforce educational efforts. The following was a short summary of crop and pest management data used in TAg meetings.

Alfalfa	Fields Over Threshold
Alfalfa Weevil	3
Potato Leafhopper	6
Field Corn	Fields Over Threshold
Corn Rootworm	4

Table 1: Insect Pest Scouting Data

When scouted for alfalfa weevil, several of the participants' alfalfa fields were over threshold. Participants utilized this valuable information in making decisions to harvest fields early where possible. A number of these same fields also were over threshold for PLH during the season. Our scouting provided information to help the participants to make informed decisions on appropriate control measures. Four of the 6 fields scouted for corn rootworm were over threshold providing participants with an opportunity to consider rotation or insecticide treatment.

Several of the farmers utilized the summaries of the rainfall and growing degree-days that they helped collect (Figure 2+3). Rainfall information was used by participants to help predict the effectiveness of pesticide applications and the need to scout for escapes. Rainfall was also used in combination with PSNT to make decisions on side dress N applications on some participating farms. Growing degree-days were obtained on individual farm locations starting on May 23rd; this limited the applicability in predicting AW life cycle and GDDs for corn on individual sites. We used max and min temperatures from the county airport combined with individual site information as an estimate of the GDD accumulation on each site for the season. The information was used as a guideline for corn maturation. This information was used during the meeting when we discussed

milk line development, sampling and dry matter determinations and corn hybrid selection.

This delay in obtaining the site weather information occurred because of the date of hire for the scout and time to order the components, assembly and placement of weather apparatus on the farms. We will avert this problem in 2001 because the stations are already assembled and many of the participants from this year's program have agreed to record this information in 2001.

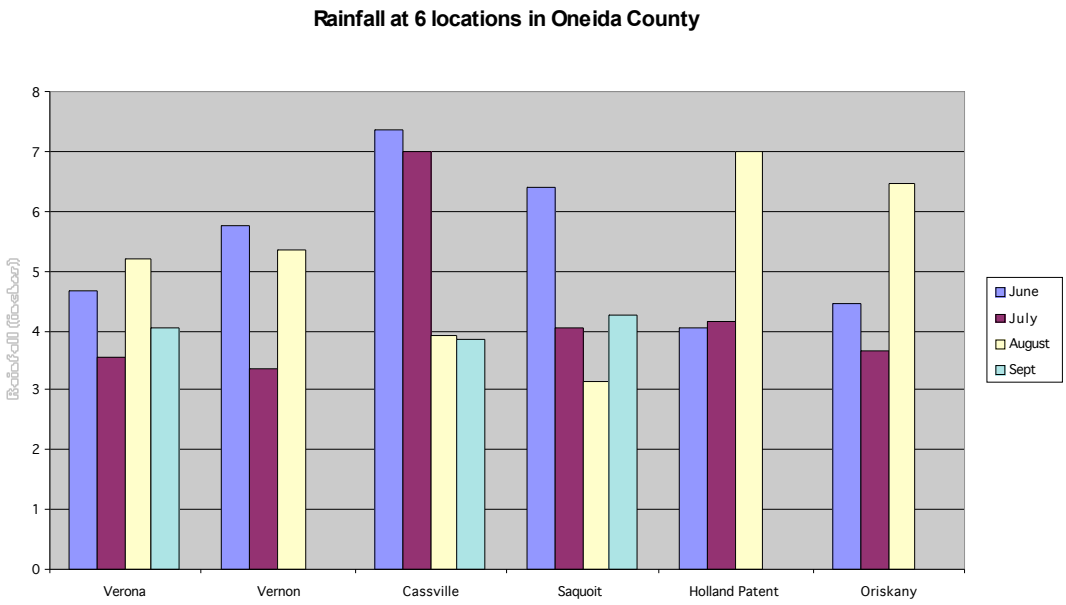

Figure 2: Rainfall at 6 locations in Oneida County (June – September 2000).

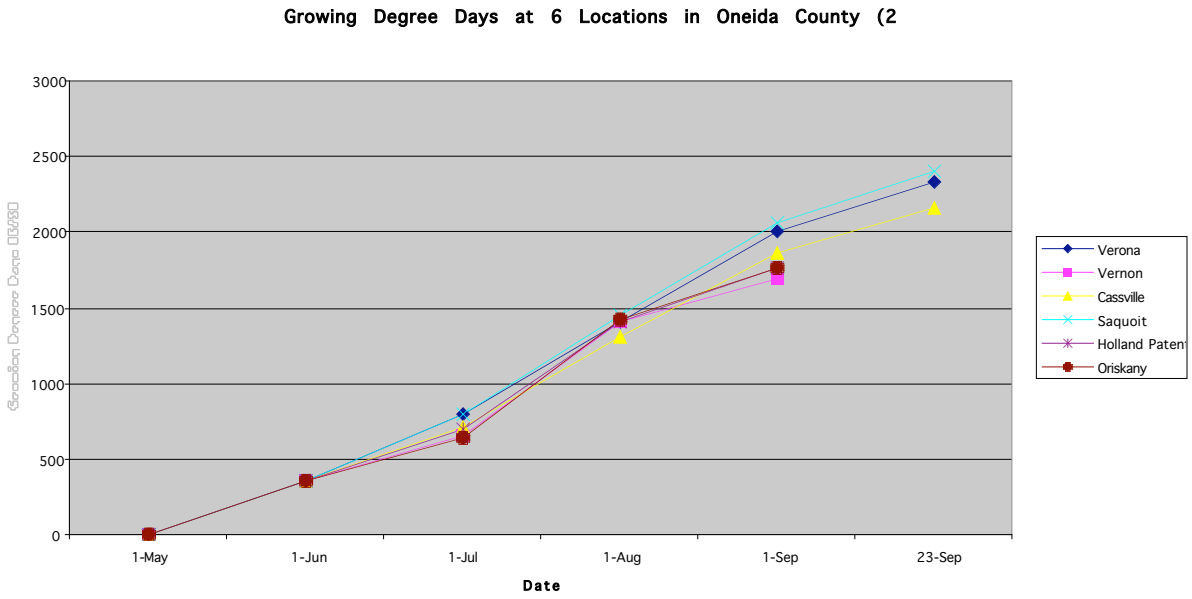

Figure 3: Growing Degree-Days 86/50 methods

As a result of the TAg meetings farmers increased their knowledge of crop and pest management (Figure 1). The summary of the exit survey indicated that participating farmers will incorporate a number of the pest and crop management practices demonstrated in this program as indicated in (Table 1). Farmers indicated a substantial increase in the number of acres where they would apply integrated crop or pest management practices to better evaluate crop conditions.

Field Corn IPM	**% Will Do**	**% Will Try**	**% Will Not Do**	**Increase Acres in IPM**
Scout for corn disease	20	60	60	1370
Scout for corn rootworm	20	80	0	1970
Conduct weed surveys	100	0	0	2120
Conduct plant population counts	60	40	0	1185
Scout for early season corn insect pests	20	80	0	1870
Alfalfa IPM	**% Will Do**	**% Will Try**	**% Will Not Do**	**Increase Acres in IPM**
Scout for alfalfa disease	0	80	20	580
Scout for alfalfa weevil	20	60	20	560
Scout for potato leafhopper	20	60	20	530
Conduct weed surveys	0	80	20	560
Conduct plant population counts	20	20	60	330
Fly Management	**% Will Do**	**% Will Try**	**% Will Not Do**	
Use spot cards to determine levels of fly infestation	0	25	75	
Scout for stable flies on the legs of cattle and calves	50	25	25	
Increase sanitation of moist organic matter on the farm	50	50	0	
Will reduce the use of insecticides for fly control	25	25	50	
Use bait traps to help control and scout for flies	50	50	0	
Use large fly glue traps (Spider Web) in barns	75	25	0	
Release parasitoids to help control flies	0	25	75	
Crop Management	**% Will Do**	**% Will Try**	**% Will Not Do**	**Increase Acres in ICM**
Conduct soil testing to determine proper fertilization needs	100	0	0	2100
Understand the importance of crop rotation relative to pests	80	20	0	750
Understand the importance of testing forage for nutritional quality	100	0	0	1500

Table 1: Results of the TAg Participant Survey

Farmers indicated that 40% highly and 60% moderately agreed with the statement "TAg helps growers understand the importance of pest and crop management issues." When asked "Would you recommend TAg to other farmers in your area?" 20% highly agreed, 60%moderately agreed and 20% were not sure.

Other Benefits of the Scouting Program to the County

The information obtained by the program assistant in his weekly scouting activities was summarized and faxed to 36 local agribusinesses, CCE, NRCS and SWCD offices. Agribusinesses receiving the information found it useful and passed the information on to

their clients when appropriate. We received positive feedback from the agribusinesses receiving this timely information.

The same information was developed into a script and recorded on messages available for access 24 hrs./day, seven days a week.

Rainfall and growing degree-day data was summarized and graphically depicted on our web site. The current year's rainfall and GDDs were compared to rainfall and GDDs for our area during 94-97. Scouting report summaries were published to the web site on a weekly basis.

Areas of Improvement

- The weather station information should be collected starting in mid-March. This year we were delayed until late May. This situation will be avoided next season because the stations are already assembled and we already have volunteers to record the information.
- Our new phone system was set up in the winter prior to the start of this project. We learned how to use the messaging features of our phone system by recording the IPM summaries. We will be operating more efficiently with this past years' experience.
- We had limited experience in developing web pages prior to this IPM project and were forced to learn through the project. We have much more to learn about web page development, design, web site management and evaluation of web site usage but we learned a great deal during this past year and would be able to develop more supportive materials in the future. There is a great need to develop or link to sites that have good pictures of pests: insects, diseases and weeds to assist growers in pest identification. There are additional needs to include pictures of crop hunger and pesticide and environmental injuries to crops. There is a need to include information on the economics of pest damage. We need to include an explanation of the appropriate scouting methods and thresholds for NY State. Inclusion of pictures of growing crops in season would be useful to illustrate our crops' stage of development and discuss the timing of appropriate field activities; i. e., cultivation, herbicide options or limitations, side dressing, etc.
- Web page development is an area that could be expanded upon to a great degree. It would be more appropriate for IPM specialists and Cornell Research and Extension staff to develop Web pages containing basic information on common pests in NY State that could be linked to CCE Association Web sites.
- We are currently exploring equipment capabilities to improve on our ability to provide up-to-date information to targeted groups via fax.
- We would suggest improvements in engaging local agribusinesses as multipliers of information gleaned in scouting activities. We are surveying that group in the winter to determine their interest levels and assess their needs. We would suggest more promotion of the value of this information to their clientele. We believe there is a need to discuss how they can get that information out to their clients. There is an additional need to develop a system to track how many producers are

reached with the information to help us evaluate this method of providing information.

Appendix

A: An example of Pre Side Dress Nitrate (PSNT) soil sample lab report obtained for each participating farm. This was used in discussion of meeting corn N needs with organic and non-organic sources of N. This was an important issue in relation to mineralization of N in a cool spring, late planting of corn crops, low nitrate levels in PSNT lab results and potential for leaching of nitrate with substantial rainfalls during the spring.

B: An example of a forage analysis lab report. Five to six samples were taken form one alfalfa field per participants farm at 3-5 day intervals to track plant quality changes with the objective of identifying the prime time to harvest the crop for optimal quality. The lab values were also compared with Fick MSC and PEAQ estimates for discussion of the merits of these methods to estimate forage quality.

C: Some samples of Web pages constructed to provide area producers access to current information about crop conditions and local pest infestations. Some additional pages on local weather conditions (rainfall and GDDs) that were updated regularly to help producers identify how the season was progressing (especially GDDs) with an additional page showing comparisons of the current season with local weather data collected over a four year period (94-97). Additional pages were developed as time permitted to provide growers with more specific information about some common pests: their life cycle, damage to crops, scouting method and economic thresholds and management options.

D: An outline of the prerecorded messages available to the public and area farmers as of 7-11-00. The objective was to update the weather and scouting information weekly and add and remove other topics to present timely issues.